



Geosynthetic Interlayer Specification for Highway Applications MSP-04-01B

1.0 Description. This work shall consist of furnishing and placing a geosynthetic interlayer within the pavement structure as shown on the plans or directed by the engineer. The geosynthetic interlayer shall provide a moisture barrier/stress relieving membrane and shall be placed beneath a hot-mix asphalt (HMA) overlay.

2.0 Material.

2.1 Geosynthetic Interlayer. The geosynthetic interlayer shall consist of geosynthetic material, saturated with asphalt binder.

2.1.1 Geosynthetic Material. The geosynthetic material shall be of the system specified on the plans and in accordance with Appendix A: Geosynthetic Material.

2.1.2 Tack Coat. The same asphalt binder to be used in the first HMA layer over the geosynthetic interlayer shall be used as the tack coat material for the geosynthetic material, unless the manufacturer of the geosynthetic material recommends a higher performance grade asphalt binder. The asphalt binder shall be in accordance with Sec 1015. No emulsions will be allowed.

2.2 Clean Sand. Clean sand shall be sand meeting Sec 1005.2 or a washed sand meeting the approval of the engineer.

3.0 Equipment. Equipment used to place the asphalt tack on the geosynthetic material, to install the geosynthetic material or to roll the geosynthetic material into the tack coat shall be in accordance with the manufacturer's recommendations.

4.0 Construction Requirements.

4.1 The geosynthetic material shall be stored as per the manufacturer's recommendations in a dry covered condition free from dust, dirt and moisture.

4.2 The geosynthetic material shall be installed in accordance with the manufacturer's specifications and this specification. Where a conflict exists between the specifications, the more stringent specification will apply. A copy of the manufacturer's specifications shall be provided to the engineer at the pre-construction meeting or no later than five working days prior to installation.

4.3 A manufacturer representative shall be present, at minimum, for the first two days of installation of the geosynthetic interlayer and available thereafter upon request by the engineer.

4.3.1 This requirement may be waived by the engineer under the following conditions:



(a) The contractor has been certified by the manufacturer for installation of the geosynthetic material.

(b) A copy of the written certification is provided to the engineer and the contractor certification is approved by the engineer prior to installation of any material.

4.3.2 If a manufacturer representative has been waived in accordance with Section 4.3.1, the engineer will still maintain the right to require a representative to be present if the engineer deems it necessary due to poor installation practices by the contractor.

4.4 The surface on which the geosynthetic material is to be placed shall be reasonably free of dirt, water, vegetation or other debris. The geosynthetic interlayer shall be placed on a drainable surface, and any rutting or low spots in the pavement shall be removed by milling or by the use of a leveling course as shown on the plans. Cracks exceeding 1/8 inch (3 mm) in width shall be filled with suitable crack filler. Potholes shall be properly repaired as directed by the engineer. Fillers shall be allowed to cure prior to placement of the geosynthetic material.

4.5 Neither the asphalt binder nor the geosynthetic material shall be placed when weather conditions, in the judgement of the engineer, are not suitable. Air and pavement temperatures shall be sufficient to allow the tack coat to hold the geosynthetic material in place. The air temperature shall be 50 F (10 C) and rising for placement of the asphalt tack coat.

4.6 The specified application rate of tack coat shall be sufficient to satisfy the asphalt retention properties of the geosynthetic material and to bond the geosynthetic material and HMA overlay to the existing pavement.

4.7 Application of the tack coat shall be by a calibrated distributor truck spray bar. Hand spraying, squeegee and brush application will only be allowed where the distributor truck does not have room to operate and shall be kept to a minimum. Temperature of the tack coat shall be sufficiently high enough to permit uniform spray pattern and shall be at minimum 290 F (145 C). To avoid damage to the geosynthetic material, distributor tank temperatures shall not exceed 325 F (163 C).

4.8 The target width of the tack coat application shall be the geosynthetic material width plus 6 inches (150 mm). Tack coat application shall be wide enough to cover the entire width of geosynthetic material overlaps. The tack coat shall be applied only as far in advance of the geosynthetic material installation as is appropriate to ensure a tacky surface at the time of the geosynthetic material placement. Traffic shall not be allowed on the tack coat.

4.9 The geosynthetic material shall be placed onto the tack coat with minimum folds or wrinkles and before the tack coat has cooled and lost tackiness. As directed by the engineer, wrinkles or folds in excess of 1 inch (25 mm) shall be slit and laid flat or pulled out and replaced. In these repaired areas, additional tack coat shall be applied as needed to achieve a sound bond to the substrate. Damaged geosynthetic material shall be removed and replaced, per the manufacturer's recommendations, at the contractor's expense with the same type of material.



4.10 Overlap of geosynthetic material joints shall be sufficient to ensure full closure of the joint, but shall not exceed 6 inches (150 mm). Transverse joints shall be lapped in the direction of paving to prevent edge pickup by the paver. A second application of tack coat shall be placed beneath the overlapping geosynthetic material to ensure proper bonding of the double material layer.

4.11 Brooming, squeegee or pneumatic rolling shall be used to remove any air bubbles and to maximize geosynthetic material contact with the pavement surface and shall be done in accordance with the manufacturer's specifications and to the satisfaction of the engineer.

4.12 Excess tack coat that bleeds through the geosynthetic material shall be removed by broadcasting clean sand on the geosynthetic interlayer. Broadcasting of clean sand may also be used to facilitate movement of equipment during construction, to prevent tearing or delamination of the geosynthetic material or to prevent pickup by the paving machine. If sand is applied, any excess sand shall be removed from the interlayer prior to placing the HMA overlay. Scattering loose HMA mix out in front of the paver tires will also be permissible. No other material, such as asphalt release agents or diesel, shall be used for this purpose.

4.13 No traffic, except necessary construction traffic or emergency vehicles, shall be driven on the geosynthetic interlayer, unless approved by the engineer. If traffic on the interlayer is approved by the engineer, clean sand shall be lightly broadcasted over the geosynthetic interlayer, and any loose sand shall be removed prior to paving.

4.14 Placement of the first lift of the HMA overlay shall closely follow placement of the geosynthetic interlayer. All areas in which the geosynthetic interlayer has been placed shall be paved during the same day, unless approved otherwise by the engineer. In the event of rainfall on the geosynthetic interlayer prior to the placement of the first HMA overlay lift, the geosynthetic interlayer shall be allowed to dry before the HMA is placed. The compacted thickness of the first lift of the HMA overlay on the geosynthetic interlayer shall not be less than 1.5 inches (38 mm), and the temperature of the mix at placement shall not exceed the geosynthetic material melting point temperature. Where the total HMA overlay thickness is less than 1.5 inches (38 mm), geosynthetic material shall not be placed.

5.0 Method of Measurement. Measurement for furnishing and installing the geosynthetic interlayer will be made to the nearest square yard (m^2) of pavement specified to be covered.



6.0 Basis of Payment. The accepted quantities of geosynthetic interlayer will be paid for at the unit price for each of the pay items included in the contract.

403-99-05	1.0	SQUARE YARDS	SYSTEM A OR C GEOSYNTHETIC INTERLAYER (NON-WOVEN PAVING FABRIC OR PAVING MAT)
403-99-05	1.0	SQUARE YARDS	SYSTEM B GEOSYNTHETIC INTERLAYER (COMPOSITE PAVING FABRIC/REINFORCING GRID)
403-99-05	1.0	SQUARE YARDS	SYSTEM C GEOSYNTHETIC INTERLAYER (PAVING MAT)
403-99-05M	1.0	SQUARE METERS	SYSTEM A OR C GEOSYNTHETIC INTERLAYER (NON-WOVEN PAVING FABRIC OR PAVING MAT)
403-99-05M	1.0	SQUARE METERS	SYSTEM B GEOSYNTHETIC INTERLAYER (COMPOSITE PAVING FABRIC/REINFORCING GRID)
403-99-05M	1.0	SQUARE METERS	SYSTEM C GEOSYNTHETIC INTERLAYER (PAVING MAT)

Appendix A: Geosynthetic Material

1.0 Scope. This specification covers geosynthetic material, which is to be saturated with asphalt binder to form a geosynthetic interlayer, for use as a moisture barrier and a stress relieving membrane within the pavement structure. .

2.0 Material.

2.1 System A Geosynthetic Material. System A shall be a non-woven paving fabric composed of 85 percent or more polyolefin, polyester or polypropylene fibers. The paving fabric shall meet the following requirements:

Property	Test Method	Requirements ^a
Grab Strength	ASTM D 4632	100 lbs. (450 N)
Ultimate Elongation	ASTM D 4632	≥50 %
Weight (Mass) per Unit Area	ASTM D 5261	4.0 oz./s.y. (135 g/m ²)
Asphalt Retention ^{b, c} , Min.	ASTM D 6140	0.20 gal./s.y. (0.9 l/m ²)
Melting Point, Min.	ASTM D 276	300 F (150 C)

^a All numeric values shall represent Minimum Average Roll Values (MARV) in the weaker principle direction.

^b The asphalt binder retention value shall be the amount required to saturate the paving fabric only. Asphalt retention shall be provided in the manufacturer's certification. Numerical value does not indicate the asphalt application rate required for construction.

^c Product asphalt retention property shall meet the specified MARV value.

2.2 System B Geosynthetic Material. System B shall be a composite paving fabric consisting of paving fabric bonded to a reinforcement grid. The paving fabric shall be in



accordance with Section 2.1. The reinforcement grid shall be either an epoxy or elastomeric polymer coated glass fiber structural grid. The composite shall be in accordance with the following physical properties:

Properties	Test Method	Requirement
Grid Tensile Strength ^a	ASTM D 6637	560 lbs/in. (100 kN/m)
Grid Elongation at Break	ASTM D 6637	< 5 %
Grid Junction Strength ^b	GSI/GG-2	15 lbs. (67 N)
Grid Melting Point, Min.	ASTM D 276	425 F (218 C)
Aperture Size, Max., MD/XD ^c	- -	1.02/1.2 in. (26/30 mm)
Peel Strength, Fabric to Grid	ASTM D 413	10 lbs/ft (146 N/m)

^a All numeric values shall represent MARV in the weaker principle direction.

^b Tested with grid attached to the paving fabric.

^c Shall be centerline to centerline, where MD = machine direction and XD = cross-machine direction.

2.3 System C Geosynthetic Material. System C shall be a geotextile paving mat composed of 50 percent or more fiberglass fibers. The paving mat shall meet the following requirements:

Properties	Test Method	Requirement ^a
Breaking Strength, Min.	ASTM D 5035	45 lbs/2 in. (200 N/50 mm)
Ultimate Elongation.	ASTM D 5035	< 5 %
Weight (Mass) Per Unit Area, Min.	ASTM D 5261	4.0 oz./s.y. (136 g/m ²)
Asphalt Retention ^{b, c} , Min.	ASTM D 6140	0.20 gal./s.y. (0.9 l/m ²)
Melting Point, Min.	ASTM D 276	400 F (205 C)

^a All numeric values shall represent MARV in the weaker principle direction.

^b The asphalt binder value shall be the amount required to saturate the paving fabric only. Asphalt retention shall be provided in the manufacturer's certification. Numerical value does not indicate the asphalt application rate required for construction.

^c Product asphalt retention property shall meet the specified MARV value.

3.0 Prequalification. Prior to approval and use of this material, the manufacturer shall submit to Construction and Materials a certified test report showing specific test results from an independent laboratory in accordance with all requirements of these specifications. The certified test report shall contain the manufacturer's name, brand name of material, lot tested and date of manufacture. In addition, the manufacturer shall submit a one square yard (m²) sample for laboratory testing accompanied by a technical data sheet and an MSDS. New certified test results and samples shall be submitted any time the manufacturing process or the material formulation is changed and may be required when random sampling and testing of material offered for use indicates nonconformity with any of the requirements specified. The following may be used on projects upon acceptance of the material in accordance with Section 4.0:



System	Brand Name	Manufacturer
A	Petromat	Amoco Fabrics and Fibers Co. 260 The Bluffs Austell, GA 30168
B	PetroGrid 4582	Amoco Fabrics and Fibers Co. 260 The Bluffs Austell, GA 30168
B	CompoGrid 100	Saint-Gobain Technical Fabrics 345 Third St., Suite 615 Niagara Falls, N.Y. 14303
C	TruPave Paving Mat	Owens Corning One Owens Corning Parkway Toledo, OH 43659

4.0 Certification. The contractor shall furnish a manufacturer's certification to the engineer for each lot of material furnished stating the name of the manufacturer, the chemical composition of the filaments or yarns and certifying that the material supplied is in accordance with this specification. The certification shall include or have attached typical results of tests from specific lots for all specified requirements.

4.1 The manufacturer shall be responsible for establishing and maintaining a QC program to assure compliance with the requirements of this specification. Documentation describing the QC program shall be made available to the engineer upon request.

4.2 The manufacturer's certificate shall state that the furnished material meets MARV requirements as evaluated under the manufacturer's QC program. A person having legal authority to bind the manufacturer shall attest to the certificate.